C^3 IN MANEUVER WARFARE:
The Expanding Role of the Communications Officer

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Outline

Thesis. For C^3 in maneuver warfare to be successful, the Communications Officer must be a key player in tactical planning and a dynamic C^3 architect. He must understand the C^3 process and be able to design and implement a flexible system that will support the process in the maneuver environment. Only by understanding and applying "maneuver C^3" can the Communications Officer get the right information to the right people at the right time.

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C^3 IN MANEUVER WARFARE:

The Expanding Role of the Communications Officer

In 1989, the Commandant of the Marine Corps, General A.M. Gray, endorsed the Marine Corps philosophy on warfighting in FMFM 1 (33). The adoption of this maneuver warfare philosophy has raised many important issues about the future role of the communications officer in the command, control, and communications (C^3) process employed within the Marine Air Ground Task Force (MAGTF). Over the past two decades, the rapid advance of technology has literally taken the communications officer out of the command and control process and made him a communications systems specialist. The result is a communications officer who is perceived by many commanders and other staff officers as an innocuous technocrat whose primary function is to keep the radios and telephones working. For C^3 in maneuver warfare to be successful, the communications officer must be a key player in the overall planning process as well as a dynamic C^3 architect (30). He must understand the C^3 process and be able to design and implement a flexible system that will support it in the maneuver environment. Only by understanding and applying "maneuver C^3" can the communications officer get the right information to the right people at the right time.

This paper presents a philosophical understanding of maneuver C^3 and the communication officer's expanding role as a

systems architect. C^3 is both a process and a system. We will examine both of these roles to determine the ideal architecture necessary to support maneuver warfare. Figure 1 depicts this dual role of C^3 and serves as an outline for our paper.

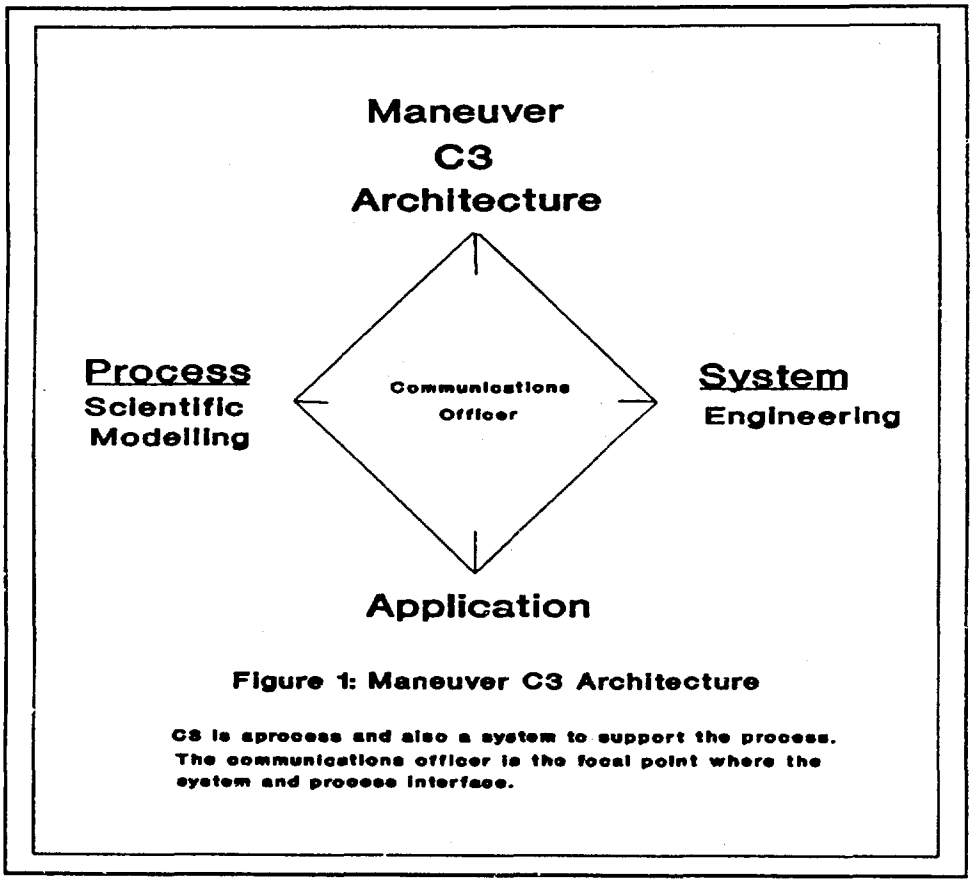

Figure 1: Maneuver C3 Architecture

C3 is a process and also a system to support the process. The communications officer is the focal point where the system and process interface.

C^3 IN THE MANEUVER ENVIRONMENT

FMFM 1 defines maneuver warfare as "a warfighting philosophy that seeks to shatter the enemy's cohesion through a series of rapid, violent, and unexpected actions which create a turbulent and rapidly deteriorating situation with which he cannot cope" (33:59). For the communications officer, this warfighting philosophy advocates actions such as:

Accept uncertainty on the battlefield (33:6). Communication plans (COMMPLAN's) and standing operating procedures (SOP's) do not cover all possible situations or contingencies that the communications officer may face. Additionally, the COMMPLAN's and SOP's must be kept as simple as possible or they will generate a high level of uncertainty for friendly forces. Equipment may or may not function as expected. Communications personnel may or may not accomplish the tasks and functions assigned to them. There will be a host of unknowns about the enemy's situation, the environment, and the friendly unit's own situation.

Focus on the enemy and destroy his will to resist (33:20). The communications officer must design the optimum system to focus the commander's total combat power strictly on the enemy. If the system or facilities which are established do not serve to influence the enemy in a form favorable to the commander, then they detract from the command's sole reason for existence.

Create and exploit advantage (33:61). The communications officer must be a master of the electromagnetic spectrum to exploit its capabilities to the maximum extent. He must design flexible and responsive systems that can easily shift to allow the unit to take full advantage of enemy weaknesses as they occur on the battlefield. Similarly, he must design the integrated systems to counter the enemy's attempts to create and exploit

advantages within the electromagnetic spectrum.

Reinforce success (33:35). The communications officer must aggressively employ all assets (personnel, equipment, etc.) at his disposal to support success when it occurs throughout the battlefield. He must identify and eliminate practices which are not successful. The communications officer must not invest time, energy, or resources to support ventures that are not achieving success or positive response on the battlefield.

Generate speed (velocity and tempo) (33:32). The communications officer can enhance the velocity and tempo of operations by ensuring that COMMPLAN's, SOP's, etc. are thoroughly understood and practiced by all members of the command. The human element is likely to be the slowest in the C^3 system and the communications officer should plan and adjust his actions accordingly. He can also generate speed by reducing the total number of nets, links, and nodes to the bare minimum required. COMMPLAN's, SOP's, and systems should be as simple as possible to minimize friction.

Designate a focus of main effort, a supporting attack, and a reserve force (33:72). As a leader and manager, the communications officer must ensure that all C^3 assets are employed in a manner consistent with the commander's intent and scheme of maneuver. The priority of support must always be

oriented towards the focus of main effort. The communications officer must plan accordingly to integrate and support the supporting attack and the reserve force in the accomplishment of both their assigned and implied missions. Ultimately, he must be prepared to shift the system's emphasis and support when the focus of main effort changes.

Decentralize command, control, and communications (C^3) (33:62). The communications officer cannot design, install, operate, and maintain the entire communications system. He must rely upon the skill, initiative, and innovation of other communications personnel to provide a system which functions within the commander's intent. Whenever feasible, he should remove any procedures which add complexity or delays to the system. For example, staff officers should transmit critical message traffic themselves instead of first writing the message down and then giving it to an enlisted radio operator for transmission.

Command, control, and communications are inseparably dependent components of one process. JCS Pub 1-02, DOD Dictionary of Military and Associated Terms, defines command and control as "the exercise of authority and direction by a properly designated commander over assigned forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications,

facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission." Every commander requires critical information to allocate, direct, and control his assigned forces. In maneuver warfare, the information must be timely, accurate, and pertinent -- enabling the commander to act boldly and decisively to seize fleeting opportunities against the enemy.

C^3 is an active process as indicated by the action verbs planning, directing, coordinating, and controlling. Communications is the **total medium** in which the command and control process takes place. Further, since "war is a human enterprise and no amount of technology can reduce the human dimension," (33:62) we conclude that maneuver C^3 is the merging of a human process with a technological system.

Our C^3 philosophy must not only accommodate but must also accentuate human attributes such as boldness, initiative, personality, strength of will, and imagination (33:62). To reinforce these traits, we must be willing to decentralize C^3. Communication officers must balance the physical capabilities and limitations of the C^3 system with a thorough knowledge of the C^3 process. To fully appreciate the scope of this process, the communications officer must view it as both a science and an art.

C^3 PROCESS: SCIENTIFIC MODELLING

C^3 modelling provides a framework for visualizing and understanding the process much as node diagrams provide an understanding of the system. There are many models of the C^3 process. One of the most widely recognized is Colonel John Boyd's OODA (Observe, Orient, Decide, Act) Loop illustrated in Figure 2. This simple model accurately captures the most basic functions of the C^3 process as it applies to aerial combat. There are several other good models which can help the communications officer understand the C^3 process as it applies to maneuver warfare.

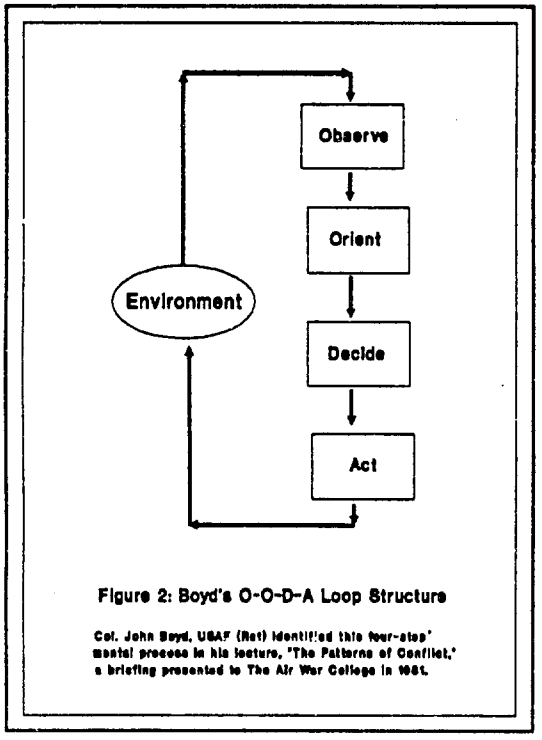

Figure 2: Boyd's O-O-D-A Loop Structure

Col. John Boyd, USAF (Ret) identified this four-step mental process in his lecture, "The Patterns of Conflict," a briefing presented to The Air War College in 1981.

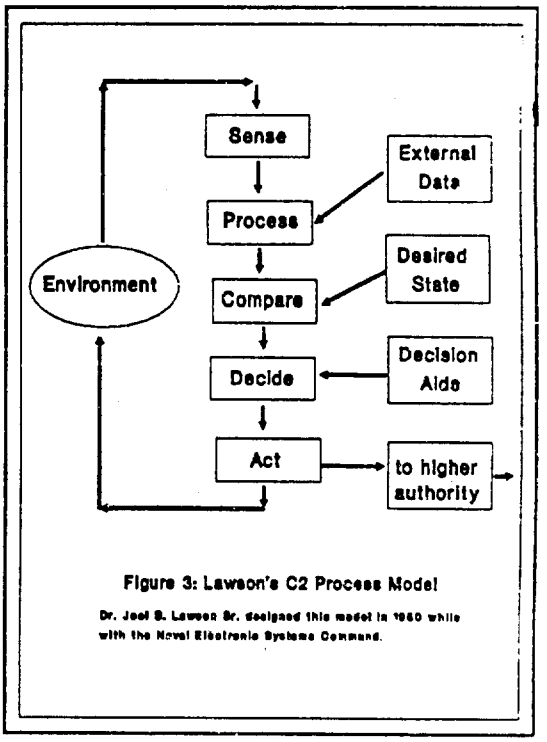

Figure 3: Lawson's C2 Process Model

Dr. Joel S. Lawson Sr. designed this model in 1980 while with the Naval Electronic Systems Command.

We recommend Dr. Joel S. Lawson's C^2 process model (Figure 3) which makes a distinction between the "SENSED" state and the

"DESIRED" state (1:5). This distinction is closely intertwined in the C^3 process because the human mind ultimately formulates both the sensed (current) and the desired (future) states of the environment. We also recommend Major George Orr's Combat Operations Process model (Figure 4).

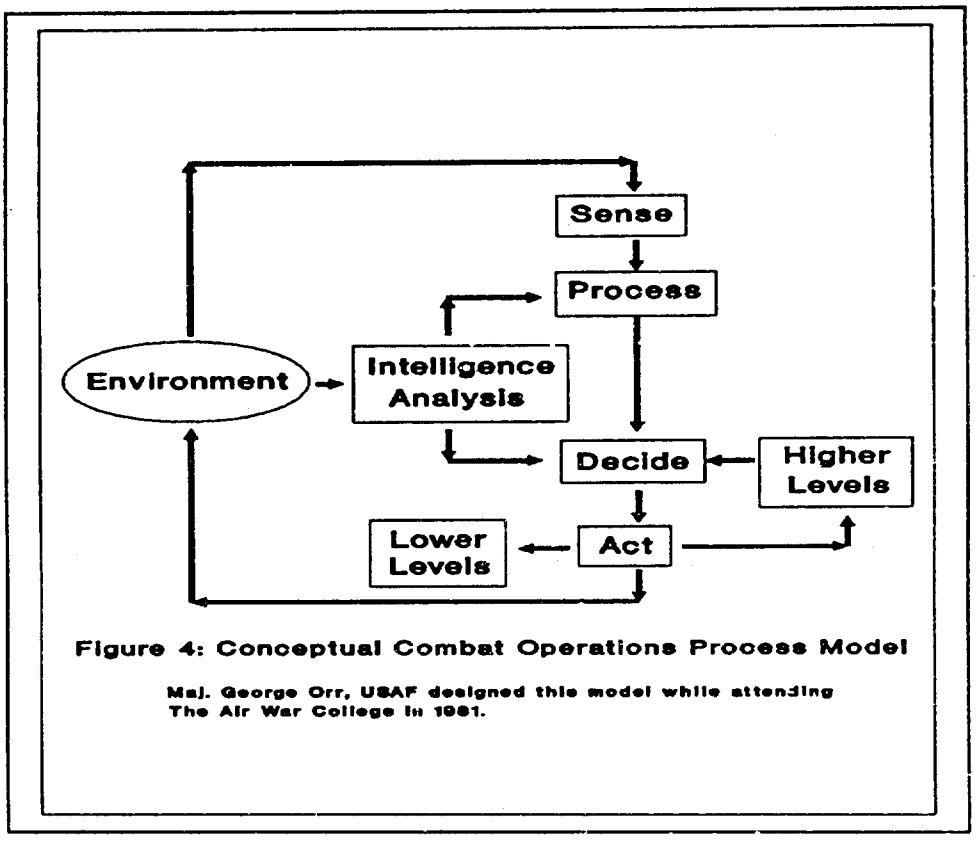

Figure 4: Conceptual Combat Operations Process Model

Maj. George Orr, USAF designed this model while attending The Air War College in 1981.

Major Orr proposed that decisions be made based on probability rather than certainty. Absolute certainty is impossible to achieve on the battlefield. Consequently, the C^3 process must focus on determining the acceptable risk which can be offset by the increased speed of the process. In simpler terms, if we function faster than the enemy we can absorb more risk than he can (21:27).

Perhaps the most useful model of the C^3 process is one designed by Colonel Gary Q. Coe, USA, and Dr. John T. Dockery (1:25). This C^3 model (Figure 5) accounts for enemy as well as friendly C^3 and the value of the relative process execution time between the two.

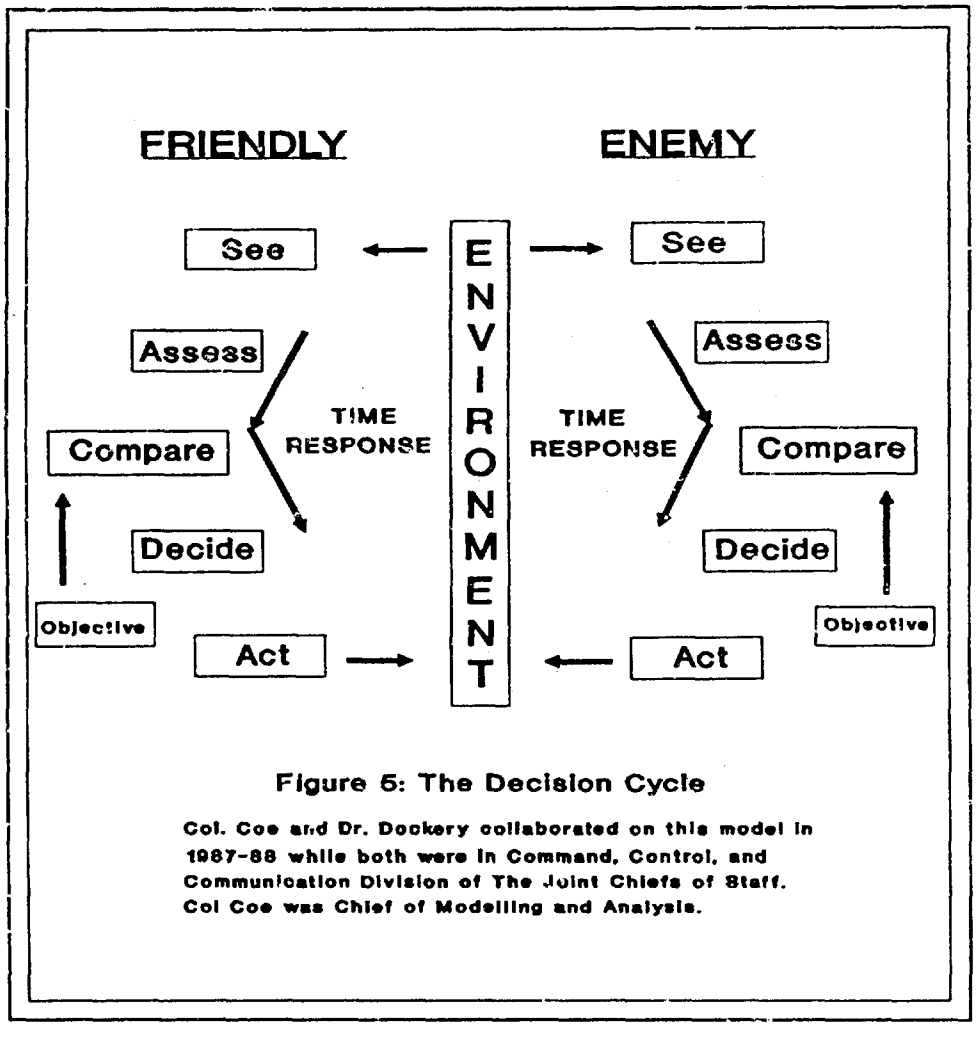

Figure 5: The Decision Cycle

Col. Coe and Dr. Dockery collaborated on this model in 1987-88 while both were in Command, Control, and Communication Division of The Joint Chiefs of Staff. Col Coe was Chief of Modelling and Analysis.

The Coe-Dockery model describes the dynamics of the combat environment. Using cybernetic concepts, Coe and Dockery established the following relationships between the C^3 process and the combat environment (1:20):

The observer is crucial. Psychological research supports the idea that we tend to "SEE" what we expect to see. The commander who develops his sensed state of the environment from an impaired or distorted view of the battlefield is doomed to fail. Historically, masters of the art of war often used the "directed telescope" to improve the accuracy of their view of the battlefield. The directed telescope consisted of either trusted personnel or some means of electronic surveillance directly controlled by, and reporting only to, the commander (19).

Information may be infinite. Continuous and instantaneous communications can lead to information overload. The environment is in constant flux and updated information can be generated every few seconds. The C^3 process must be able to "ASSESS" what is <u>happening</u> instead of constantly updating what <u>is</u>. Focusing on actions in progress allows us to project the sensed state of the environment into the future.

There will be many interactions and surprises. The sensed state of the future is "COMPARED" to the desired state. There is an inherent uncertainty in looking at the future. We will be surprised. When we are surprised, we must ask: Are we moving through space and time toward the desired state? If so, how can we increase speed? If not, how do we get back on course?

The process of selecting options is best when decentralized. Our decisions are based on a sensed state of the environment; however, our actions occur in the real world. Consequently, when we "DECIDE" we should be as close to the action as time and space will allow.

The C^3 subsystems cannot be studied independently of each other. C^3 subsystems are integrated to support one process. The process happens at the rate of the slowest function. For instance, if the subsystem designed to support the "SEE" function is providing more information than the "ASSESS" subsystem can process, then the overall speed of the C^3 process is slowed to the level at which all of the subsystems can effectively interact.

The consequences of system operations are irreversible with respect to time. The C^3 process is moving forward through time and space. A failure of the C^3 system to support the process at any given time is irreversible. The process continues because humans are at the core of the process and humans will continue to **SEE-ASSESS-COMPARE-DECIDE-ACT** until they are dead.

Coe and Dockery also recognize the "fog of war" which sums up the effects of all uncertainties associated with combat operations and produces at a minimum a non-linear battlefield (1:22).

The Coe-Dockery model provides excellent insight into the maneuver C^3 process and a solid foundation on which to develop a C^3 system. However, no scientific model can account for all aspects of the C^3 process, especially those human aspects which come to light only through the study of actual combat operations. One such study, Maneuver C^3: Its role in the employment of Confederate Calvary during the Gettysburg Campaign, is included in Appendix 1.

C^3 PROCESS: ARTFUL APPLICATION

Martin Van Creveld, in Command In War, first draws together the idea of a master of the art of command, control, and communications. He asserts that masters like Napoleon and Von Moltke used the best technology available, but did not become slaves to that technology (8:147), Instead, each man circumvented the existing system to impose his own unique formula for success. C^3 is a human process supported by C^3 systems and technology. Every model we examined attempts to freeze and capture the essence of the C^3 process in the same manner that a camera takes a photograph. All action is frozen. Therein lies the major limitation of scientific modelling. The battlefield is dynamic and uncertain, but we can adopt measures to reduce that uncertainty and develop a sense of when to act with or without technological support. These measures include SOP's (Standing Operating Procedures), realistic training, mission-type orders,

unit cohesion, and trust tactics (34).

SOP's provide an understanding of how we operate as an integral unit. A thorough SOP that is exercised relentlessly in peacetime will provide an "automatic pilot" during battle. With comprehensive SOP's, we can conduct realistic unit level training that ensures complete understanding of the SOP itself and, more importantly, of the various personalities involved in the process: How they think, what they think, and how they react to various situations. Intensive training coupled with a good SOP enables us to communicate implicitly through mutual understanding. Implicit communications allows unit commanders to issue mission-type orders and further decentralize the C^3 process.

Mission-type orders convey the commander's reasoning (in order to...) and vision of success (intent). With mission-type orders, the senior commander need not make all of the decisions and control all of the actions that must be accomplished in order to move from the "SENSED" state to the "DESIRED" state. Subordinate commanders have the freedom to exercise their boldness, initiative, personality, strength of will, and imagination so long as their actions support the senior commander's intent. When there is a mutual understanding of the commander's intent throughout the C^3 process, a synergistic effect results. If senior commanders trust their subordinate

commanders to act within the given intent, then the synergism results in an increased operational tempo. Unavoidably, senior commanders will lose some control over the actions of their subordinates, but they will retain the ability to guide the command in the overall accomplishment of its objectives.

We believe that a thorough understanding of the C^3 process is critical in designing a C^3 system to support the C^3 process. The communications officer is the focal point where the process and the system come together.

In a maneuver environment, the unexpected will surely happen. In order to engineer an effective C^3 system, the communications officer must fully understand his commander's intent and know what information must be communicated to whom. The purpose of this system is to employ technology and techniques to get the right information to the right people at the right time.

C^3 SYSTEMS: ENGINEERING

We will not discuss the specific types of equipment and pathways which may be used to engineer a C^3 system. Clearly, the communications officer must be intimately familiar with the tools of his trade. We will however examine the C^3 system as a whole

in order to determine the characteristics it must possess to support the Corps' warfighting doctrine.

Conceptually, a C^3 system may fall anywhere on the continuum between centralized and decentralized. A centralized system (Figure 6) affords relative certainty to higher command echelons by providing them with aggregate information from, and positive control over, subordinate echelons. This type of system, which generally reflects our peacetime C^3 structure, has two major benefits. First, senior commanders are able to train and evaluate subordinates who are considered equal and interchangeable, i.e., four rifle companies, three artillery batteries, etc. Second, senior commanders are institutionally an integral part of the subordinate commanders C^3 process.

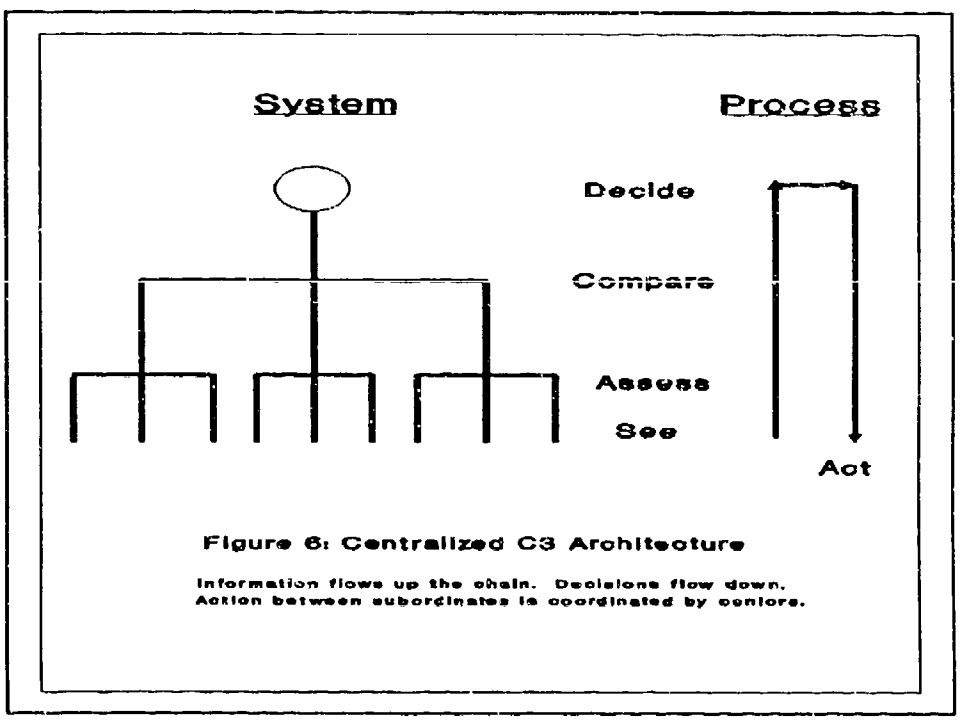

Figure 6: Centralized C3 Architecture

Information flows up the chain. Decisions flow down. Action between subordinates is coordinated by seniors.

In maneuver warfare we acknowledge that subordinate commands may not be equal. At a minimum, the senior commander will designate a focus of main effort, a supporting attack, and a reserve force (3). Additionally, the senior commander will often task organize his subordinates, further establishing unique entities.

A decentralized C^3 system, therefore, adds lateral lines of communications and encourages initiative and boldness from subordinates. Unfortunately, these attempts failed to adequately support a decentralized C^3 process. Because the subordinate's C^3 system was designed to support the senior's C^3 process, subordinate echelons of command lacked the C^3 system capabilities to exercise more than token initiative in exploiting opportunities.

In maneuver warfare the C^3 process should interact simultaneously throughout all levels of command. The subordinate commander must have the C^3 connectivity to enable him to **SEE-ASSESS-COMPARE-DECIDE-ACT** in consonance with the senior commander's intent. The optimum system is decentralized and allows the subordinate real-time access to the functional areas supported by the senior command. No doubt decentralization contributes to uncertainty--particularly at the senior command level. However, the focus of main effort must have C^3 potency in order to exploit fleeting windows of opportunity. The senior

commander, who designates the focus of main effort and provides the vision of success, must be willing to support his subordinate's initiative in fulfilling that vision. Figure 7 illustrates this concept.

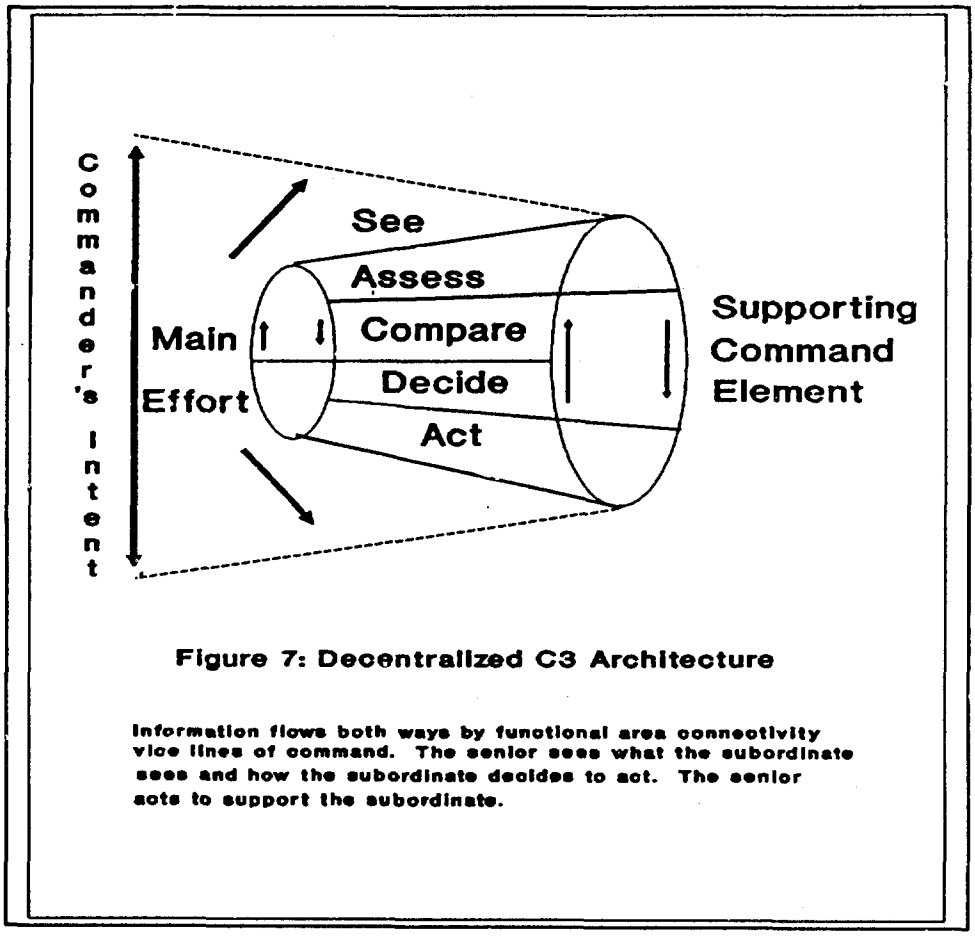

Figure 7: Decentralized C3 Architecture

Information flows both ways by functional area connectivity vice lines of command. The senior sees what the subordinate sees and how the subordinate decides to act. The senior acts to support the subordinate.

Decentralizing the C^3 system is more a matter of command relationships, individual egos, and personality traits than the limitations of technology. The communications officer must study and understand the decentralized process in order to design a C^3 system to support it. The C^3 system should have certain characteristics (2:53) which enable it to function effectively in the maneuver environment. These characteristics are:

A large processing capacity. A maneuver C^3 system should have as much cognitive, computational, and communications processing capability as possible, within the lift and mobility limitations of an expeditionary force. However, the procedural dimensions of processing are at least as important as the technical dimensions. For instance, a courier may be a more effective means of communications than a high speed data link which may exceed the output device's capacity within the system.

Quick reaction time. In maneuver warfare, our C^3 systems must react faster than those of our enemy's. The higher the ratio of the processing capacity to the processing load, and the more decentralized the maneuver C^3 system is, the faster the system's reaction time will be.

Flexibility. Maneuver C^3 flexibility is enhanced by the development and rehearsal of maneuver C^3 SOP's that encompass a broad range of tactical and operational scenarios. Confronted by unforeseen contingencies, the communications officer will either have to improvise or rely upon inadequate SOP's that do not support the conditions of the battlefield.

Interoperability. Interoperability allows the USMC maneuver C^3 system to interface with the C^3 systems of other armed forces. The importance of this capability should be evident given the current emphasis upon joint and combined military operations.

The communications officer may have to weigh the advantages of interoperability of one system component against the larger processing capacity of another Marine Corps unique component.

Survivability. Survivability is enhanced not only by physical means, but also by procedural actions. Organizational capabilities and SOP's can be effective substitutes for direct, real-time communications if the aim is to avoid detection by the enemy. Implicit communications through shared expectations, perceptions, and beliefs can also enhance a C^3 system's survivability. Other means which enhance survivability include mobility, dispersion, terrain masking, and camouflage. In spite of our efforts, at some point a concerted enemy attack on our maneuver C^3 systems will achieve a limited measure of success.

Robustness. Any truly survivable system will be able to continue with its critical functions despite damage or attrition of its components. The maneuver C^3 system must allow reconstitution from those C^3 elements that survive the enemy's attacks. Redundancy throughout the system is a prerequisite for reconstitution. Realistic training with degraded communications and command facilities will enhance robustness.

These characteristics of maneuver C^3 systems provide a framework in which the communications officer can work to design a system to support his commander. These characteristics are

also a guide to predicting how effective the system will be in combat.

CONCLUSIONS

No longer can the communications officer be exclusively a communications systems specialist. He must be out and about with the staff, not hiding out in systems control or at the antenna farm. The communications officer must quickly establish a personal relationship with the commander and his fellow staff officers. He must be able to explain and exploit both the strengths and weaknesses of his system just as other staff officers do in their own fields of expertise. He must also be recognized as an equal member of the staff if he is to be of full value to the commander (35).

Accurate and timely information which is received at the right time, at the right place, and by the right person is a force multiplier. Consequently, the communications officer must focus on moving information not electrons. He must study and thoroughly understand the intricate C^3 processes within a MAGTF in order to engineer an effective system. In order to understand the process -- and know what information needs to go where and when -- the communications officer must be educated in all aspects of MAGTF operations.

RECOMMENDATIONS

Commanders and other staff officers must recognize the expanding role of the communications officer and his need to be integrated into the command and control process. We recommend that the communications officer be elevated from the special staff to the primary staff. We further recommend that his title be changed from "Communications Officer" to "C^3 Officer" in order to emphasize his responsibilities with respect to the process as well as the system. Finally, we recommend that the C^3 Officer career progression pattern emphasize consecutive tours in each of the four components of a MAGTF.

APPENDIX 1

HISTORICAL PERSPECTIVE: Maneuver C^3: Its role in the employment of Confederate cavalry during the Gettysburg Campaign.

FMFM 1 describes the Marine Corps' doctrine on maneuver warfare. The goal of this warfighting philosophy is to render the enemy incapable of resisting by shattering his ability to fight as an effective and coordinated whole, rather than to destroy him physically through incremental attrition (33:29). Ideally, a "maneuverist" seeks to circumvent known enemy strengths while applying superior combat power at the critical time and place against **known enemy weaknesses.** To successfully operate in this environment, the communications officer must be a master of **all** facets of command, control, and communications (C^3) within the Marine Air Ground Task Force (MAGTF). He must painstakingly study the interactions between maneuver, the C^3 process, and C^3 systems to support his commander's tactical and / or operational intent. To enhance his knowledge and professional development, the communications officer should also consider some of the countless lessons in C^3 found throughout military history. He should pay particular attention to those decisive military campaigns whose outcome was greatly influenced by the existing C^3 system's ability (or inability) to penetrate the "fog of war." An excellent example from American history which illustrates the devastating results of a maneuver C^3 failure is General Robert E. Lee's employment of Confederate cavalry during the Gettysburg Campaign.

In July of 1863, the turning point of the American Civil War occurred during the Battle of Gettysburg. At the crossroads of

this small Pennsylvania town, General Robert E. Lee's 75,000 man Army of Northern Virginia and General George G. Meade's 97,000 man Army of the Potomac met by chance when a Confederate brigade sent there for supplies observed a forward column of Union cavalry. The resulting battle lasted several days and effectively crippled both armies. For the Army of Northern Virginia, Gettysburg proved to be the **culminating point** in the war (after this campaign they were unable to conduct any large scale offensive operations against Union forces) (4:7). In the previous two years of the war, the swift and decisive Confederate victories had convinced many Northerners that the Southern armies were invincible. However, the intense battle at Gettysburg effectively drained the lifeblood from the Confederacy since they could not withstand the staggering effects of attrition style warfare such as the Army of the Potomac could endure (28,063 total Confederate casualties). For the Confederates, the devastation at Gettysburg was largely the result of many poor tactical and operational decisions made by field commanders who failed to focus their C^3 efforts to penetrate the "fog of war." To develop this thought we will focus our attention on the relationship between C^3, maneuver warfare, and the employment of the Confederate cavalry force during the initial phases of the campaign.

During the Civil War the cavalry's role was to stage raids, guard communications and supplies, screen army movements,

and occasionally act as a fast strike force. Its primary purpose, however, was to conduct reconnaissance and serve as the **"eyes and ears"** of the army commander (4:27). Throughout the month of June 1863, the Army of Northern Virginia advanced north into Pennsylvania as part of the Southern strategy for the second invasion of the North. The primary goals of this strategy were: to alter Northern public opinion and support for the war, to seize vital provisions, to fight the war on Northern soil, and to obtain European recognition for the Confederate cause. In an attempt to screen the movements of his army and probe the disposition of Union forces under General Hooker (who would soon be relieved and replaced by General George G. Meade), General Lee issued a set of written orders to his cavalry commander, Major General J.E.B. Stuart. Lee's orders directed Stuart to gain and maintain contact with Lieutenant General Ewell's II Corps in Maryland or Pennsylvania, protect the army's right flank as it moved North and East, and report any intelligence information on the enemy's movements. Perhaps the most crucial aspect of these orders was the fact that they allowed Stuart the latitude to decide whether he could fulfill his mission by passing around the rear of the Federal army thereby disrupting its exposed communications and supply lines. After reading the orders, Stuart (who was fond of wild and sweeping raids) decided that this was the perfect opportunity to prove the superiority of his cavalry and to restore the prestige he lost after the Battle of Brandy Station (June 9, 1863) (5:51).

On June 25th, Stuart and three of his five brigades headed east to carry out the assigned mission. Unexpectedly, he struck the center of Major General Hancock's II Federal Corps which was moving North across his line of march. This encounter confirmed Hooker's suspicions that Lee and his army were crossing the Potomac and moving North. Stuart sent a messenger to inform General Lee of the encounter however, the message was never received. Stuart's contact with Hancock's Corps forced him to change course and travel farther than initially expected. By June 27th his cavalry had crossed the Potomac and was within 20 miles of the Federal Capital.

This same day Stuart encountered another obstacle which further delayed the ordered link up with Ewell's II Corps. Spotting a Federal wagon train headed to resupply the Army of the Potomac, Stuart's soldiers intercepted the train and captured 125 of the Union wagons. Delayed by the encounter and slowed down by the captured wagons and supplies, Stuart decided to continue on into Maryland in spite of the fact that time was rapidly running out for him to accomplish the assigned mission. As they advanced North, his cavalry downed telegraph lines, burned bridges, and destroyed some railroad tracks.

In spite of these minor actions, Stuart still had no tangible information to report to Lee concerning the disposition of the Federal army. To complicate the situation, Stuart was

unable to communicate with Lee, primarily because he did not know where the moving elements of the Confederate army were. As a result, Stuart continued to lead his men on an exhausting ride which resulted in some minor engagements with Union forces at Hanover and Carlisle, Pennsylvania.

Finally on 1 July Lee took the initiative and ordered some of his best horsemen to search the countryside and find Stuart (note that the battle at Gettysburg had already begun). Stuart was located at Carlisle and informed of the on-going battle at Gettysburg. On July 2, while the main actions of the battle were being fought, Stuart and his cavalry were still enroute to Gettysburg. It was 11 o'clock that night when Stuart, riding ahead of his weary cavalry, reported to Lee at army headquarters near Seminary Ridge. Lee's only comment was reported to have been: "Well, General Stuart, you are here at last." (6:22). Whether true or not, Lee's official report on the battle does state that "the movements of the army preceding the Battle of Gettysburg had been much embarrassed by the absence of the Cavalry." (5:58).

Stuart's ride around the Federal army was highly controversial and failed to support the Confederate strategy of a Northern invasion as well as the principal objectives of the Gettysburg Campaign. Many authors and historians who have studied this battle regard Stuart's prolonged absence as one of

the main reasons contributing to Lee's operational failure at Gettysburg.

Overall the employment of Stuart's cavalry force indicates many shortfalls in maneuver C^3 at the tactical and operational level of war. For instance, Stuart failed to accomplish the basic missions which he was assigned by his commander (link up with Ewell's II Corps and provide intelligence on the enemy's activities). From a **command** perspective, Lee's orders to Stuart were vague and therefore easily misinterpreted. Aggravating the situation was Stuart, who in his quest for glory (after Brandy Station) apparently failed to grasp the true essence of Lee's operational intent. In any case, had Lee issued more precise orders to his cavalry commander during this **critical** phase of the Northern campaign, the outcome of the conflict at Gettysburg might have been quite different.

Once the initial orders were implemented, Lee had no **control** over Stuart and the bulk of his cavalry. It is important to note that Lee still had two brigades of cavalry at his disposal while Stuart was gone, however, he chose not to use them for reconnaissance and placed his full trust **exclusively** with Stuart. As a result, Lee totally lost the ability to control Stuart and the roving elements of his cavalry force. This not only generated a tremendous amount of friction, disorder, and chaos for the army commander but was one of the main reasons why he

could not effectively shape the course of the campaign at the operational level of war.

The absence of reliable and effective **communications** between Lee and his cavalry commander was another **significant** factor influencing the outcome of the campaign. Throughout the Civil War, battlefield communications relied primarily upon drum and fife commands for the infantry, bugles for cavalry, flags, and messengers. Communications between dispersed forces was complicated by factors such as terrain, weather, distance, visibility (daylight) and the navigating skills of the courier. The dynamic interactions between these factors created an environment with a high degree of risk (capture) and uncertainty (was the message received, understood, and carried out) in the exchange of military information. At Gettysburg, the cumulative effects of these factors proved to be too great to overcome and **effectively severed** the vital command and control link between Lee and Stuart.

The uncontrolled, uncoordinated, and autonomous actions of Stuart's cavalry infused a tremendous amount of uncertainty, disorder, and friction to the Confederate campaign. Lee **never** had the critical intelligence information which he desperately needed concerning the enemy in order to prepare the battlefield or adequately plan at the operational level. The prolonged absence of Stuart's cavalry forced Lee to commit to a major

battle at an inopportune time and place, in the "blind" about the enemy's activities, and without one of his principal maneuver elements. This not only reduced his available combat power but severely limited his ability to exploit success and dictate the terms of the battle. One of the main lessons which modern day Marines can learn from the Gettysburg campaign centers around the inevitable devastation which results when field commanders fail to focus their C^3 efforts to penetrate the "fog of war."

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